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Vol. I.

No. 9

LOUISIANA PHONOGRAPH CO.,
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NEW ORLEANS, LA.

PHONOGRAPH

A MONTHLY MAGAZINE

DEVOTED TO

THE SCIENCE OF SOUND ..

+AND+

.. RECORDING OF SPEECH.

PUBLISHED BY
THE NATIONAL PHONOGRAPH PUB. CO., L'D.
WORLD BUILDING, NEW YORK.

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With kind regards, we remain.

Yours very truly.

THE NORTH AMERICAN PHONOGRAPH CO.

Thos. R. Lombard
Vice Pres.

Dictated to and transcribed
from the
PHONOGRAPH

THE PHONOGRAM.

THE OFFICIAL ORGAN OF THE PHONOGRAPH COMPANIES OF THE UNITED STATES.

VOL. I.

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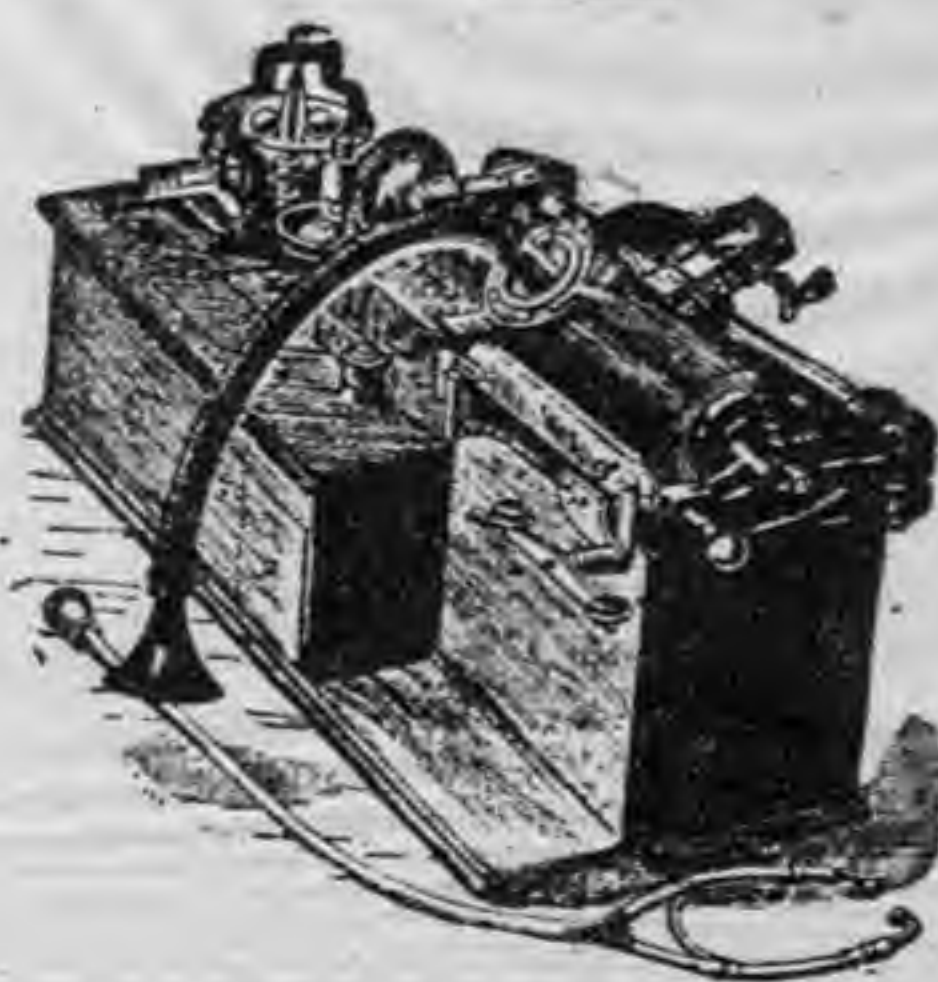
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U. S. MARINE BAND.

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In the first place, of course, everybody who has a Phonograph wants our records. The music of the **WORLD-RENOWNED UNITED STATES MARINE BAND**, which plays at the **WHITE HOUSE** for President Harrison, and has played for his predecessors, is not, and never will be, the cheapest band music, although our prices are very reasonable. You do not want the cheapest. You want the very best and most attractive music that money will buy. If you give **EXHIBITIONS OF THE PHONOGRAPH** you must have the best, in order to make the most money. If you are running **AUTOMATIC SLOT MACHINES** you must have the best, in order to make the most money. And for reproduction **IN THE HOME**, what can be more delightful than to hear the same band that plays for the President?

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A fine assortment of superb vocal records by the **Brilliant Quartet.**

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Humorous Recitations.

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(For details as to our Language Department, see advertisement covering another full page in this issue.)



A MAGAZINE devoted to all interests connected with the recording of sound, the reproduction and preservation of speech, the Telephone, the Typewriter, and the progress of Electricity.

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CORRESPONDENCE

relating to the Phonograph, Typewriter, or Electricity, in any of their practical applications, is cordially invited, and the cooperation of all electrical thinkers and workers earnestly desired. Clear, concise, well-written articles are especially welcome; and communications, views, news items, local newspaper clippings, or any information likely to interest electricians, will be thankfully received and cheerfully acknowledged.

A THEME ALWAYS INTERESTING.

Those who dwell in immediate proximity to Niagara are said to be insensible to its roar.

We who live within easy distance of the great laboratory which is pronounced by a French writer to be "unique in the world," and continually witness the birth of the creations of its presiding genius, sometimes become rather insensible to the value or merits of the offspring of so prolific a mind; and this, not because we are incapable of appreciating them, but on account of their vast variety and extraordinary qualities. Our mental eyes are dazzled, as our organs of vision are rendered inoperative by fixedly regarding the sun.

Such conditions can not exist elsewhere, for

obvious reasons, and therefore the majority of our race are only familiar with those of his inventions which afford them a saving of labor or time, or inure to their material advantage.

The phonograph may be classed as one of these, and though a great number of persons who read THE PHONOGRAM may tire of perusing articles that sound its praise, there yet remain myriads only partially cognizant of its merits, and still others who are wholly uninformed on the subject.

To both classes of these readers we now address ourselves, taking the position that THE PHONOGRAM bears to the phonograph—the relation of *alter ego*—owing the duty of writing its history to all concerned in its welfare, and aiming to familiarize the multitude with its construction, origin, and capacities, for the purpose of imparting to them the knowledge of all the phonograph can accomplish, and are confident we shall arouse new springs of enthusiasm and interest wherever our communication is read.

Mr. Edison himself did not at once realize the entire and wide-reaching usefulness of his invention when it first emerged from the manufactory in running order. He invented it more than ten years ago and looked upon it as a sort of toy. But with practice came an increasing perception of the variety of uses to which it might be applied, and he has made so many improvements on the original machine as to warrant the conclusion that it has reached that perfection at which he aimed.

The Practical Uses of the Phonograph.

It is a recorder of testimony in law courts or any other scene of action where it is necessary to transcribe with perfect accuracy and perpetuate language spoken into it.

Its mechanical accuracy renders it more useful than a stenographer or type-writer operator. The instrument never makes a mistake in technical words, or words uttered in one's own or in any foreign tongue.

It is valuable as a repeater of any foreign language, of which the correct pronunciation may be learned by pupils.

It records music from any instrument or the human voice, and repeats it at will.

It is always at hand, ready to receive dictation, which is not the case with stenographers or type-writers.

You can talk into it, thus carrying on your work at all hours of the day or night; for you do not need a light, and the instrument, unlike the amanuensis, is never sick or weary, and does not need lunch or holidays.

Its cylinders containing your messages can be sent by mail just as letters are sent.

For all these reasons the phonograph and graphophone may be classed as mechanical contrivances of the highest utility; and we believe that the day is near at hand when few families in our country, and no house where business of any sort is conducted, will fail to purchase one, since it almost fills the place of a domestic in the one and an office-boy or clerk in the other.

FESTINA LENTÈ.

The greed for riches and the haste to become rich are entangling society in a cobweb of failures. They are the barnacles on modern industry. With man's general progress come improvements in methods; and the application of newly discovered forces and methods is as much a necessity as a larger shoe for a growing foot.

It is a fact in political economy that where an original industry has been crushed out, two new ones have arisen, showing that the mission of machinery is the fulfillment of a natural law.

The phonographic republic is still young; consequently its operations were not conducted in the early stages of its life without friction. But the wise action of the National Phonograph Association, held in this city in June last, has adjusted all interests and adopted a policy which allows the vast system to perform its labors untrammelled. This is as it should be. Unity means power, and the sub-companies are, after all, simply parts of one great industrial and commercial body.

Since the issue of the order for the sale of the phonograph (in which some of the States of the American Union are now engaged) the parent

company reports such marked increase in its business as leads to the belief that this interest is on the high-road to still larger success than that already attained. With caution and conservatism to guide its way along the path of the improved régime of method, it is not unreasonable to conclude that the hands on the dial plate of the phonograph system will henceforth move in the right way, for the tissue of human interests in this great enterprise is closely woven, and can not be severed without detriment to the fabric as a whole.

AERIAL NAVIGATION.

To navigate the terrestrial atmosphere has been for ages the dream of philosophers, inventors, ambitious spirits, and those daring minds who are not content to cleave to the vast area of the earth's surface given to them as an abiding place. We have a biblical account of an attempt made by certain soaring sages to penetrate celestial regions, but they did not surrender their hold upon earth or separate themselves from *terra firma*. Their effort was unsuccessful; but their disappointment has only served as a stimulus to modern experimentalists who court not even life itself a loss in their endeavor to grasp the solution of the question of aerial navigation.

Bold attempts to construct flying machines, upon which an enormous amount of money, thought, labor and scientific research were expended, have been essayed both in the Old and New World. A novel apparatus is being perfected at present in England by Mr. Hugh Maxim. It consists of a monster kite with a frame-work of steel tubes, covered with silk, the whole covering a surface of 5,500 square feet. The generator is heated by 45,000 gas jets, the engines are of 120 horse power, and will carry 14,000 pounds. When completed the machine will weigh between 5,000 and 6,000 pounds.

With regard to aerial machines, one essential drawback has been the want of a motor sufficiently light. The Priestman oil engine partially supplies this deficiency; but all eyes are turned toward electricity as the powerful lever which will one day remedy this defect.

We believe that the apparatus constructed by that celebrated electrician, M. Emile Reynier, of Paris, to furnish motive power by electricity, will be found upon trial to fit all the needs of this and similar cases. That accomplished inventor had in view, in connection with other important subjects, that of aerial navigation when he designed this machine.

The sale of this patent for the United States has been exclusively acquired by the management of THE PHONOGRAM, and those interested in the subject will find it advantageous to apply for desired information at the publication office of this magazine, Room 87, Pulitzer Building, New York City.

A RETROSPECT.

Imagine one of those people who lived in 1830, supposing him to be a man of common sense, and not by any means gifted with an imaginative tendency, suddenly brought to life and confronted with the phonograph, can you conceive how great would be his surprise? You could make him believe that some wonderful Aladdin had been roused from a thousand years' sleep and conjured up a mysterious box in which he could confine words and sentences, and that he made their silence or singing dependent upon his word. This man would be thunder-struck, and would be ready to think, with the skepticism of a long-departed generation, that the world had gone mad.

He would probably fall into a swoon, and would beg to be restored to the tomb, preferable in his estimation to an existence resumed with a generation of lunatics or cranks. But *we*, without either the traces of insanity or incipient lunacy, witness with boundless admiration the astonishing wonders evolved from the phonograph offered to our astonished vision by the Magician of Menlo Park.

Thanks to Mr. Edison, wonders have trodden upon the heels of wonders, and the phonograph, besides serving as a medium for the transmission of speech and the storage of sounds, now finds a thousand useful applications.

There is one young husband in this city to-day, whose ears are daily greeted by the voice of a distant wife, and yet that husband is separated from her by many miles. Not only this, this favored husband and father, before taking up the cares of the day, can hear the prattle of his children, their little songs and evening prayers, with the very intonation and accent that make of the voices of one's children the sweetest of our earthly music. In return, this husband can be heard in his own home, can speak to his wife and children, and fill his domestic sanctuary with the sound of his own voice.

This marvel of marvels is not now the prerogative of one favored mortal, but is being used by thousands who enjoy communication with distant friends.

If the phonograph conferred not an iota of benefit upon the commercial world; if it were useless in any other direction—instead of possessing infinite possibilities—it would still, as a means of bringing the voice of loved ones to the ears of the loved, be worthy of the place it now holds as the *greatest invention* of the age. The social offices of the phonograph are such as bring it closer to the hearts of the people, while its merits

as an assistant in the business office or counting-room are developing rapidly. Here is a pretty little machine, a little bundle of iron nerves and sinews imbued through electricity with the great principle of life, "the soul of the world," chained by Edison's genius and forced to obey our behests.

A few days ago this machine was almost universally regarded as a toy, but now having attained the proportions of a great invention, it is without doubt destined to completely overshadow the telephone.

Most great inventions serve chiefly to cheapen the cost and increase the desirability of that which is eaten or worn, or which contributes to the comfort, convenience, and pleasure of man. Here is a device which lessens the pain of parting, makes tolerable the period of absence, and performs, what has been regarded as a miracle—gives to our ears the voice of the dead. The highest praise ever given to machinery has been, that in performing its work it has been almost possessed of the power of thought, moving and acting as would a human being. But of the phonograph we can safely say that its powers are far beyond those of its users. It can receive, retain indefinitely, and give forth at will, the voice that spoke into its shining cylinder.

Soon it will find a place in the departments of the post-office's many little compartments. Not only a letter, but a voice from home will greet the corner to the place of mail. A small tube taken from the post-office will be freighted with tender words, joyous exclamations, rippling laughter, a daughter's song, a mother's prayer, a baby's crow. What power and comfort to cheer does the small package contain! All in all, the many social attributes of the phonograph will give the invention a place of its own in the affections of the public, and its business attributes will place it upon a pedestal which no other invention yet discovered has ever held.

TALKING MACHINES OR PHONOGRAPHS.

The world has awakened to the fact that these are the most marvelous machines ever invented, and we hear of their being adopted for business purposes and amusement in every direction. Take a good type-writer and place him beside a phonograph, and see how rapidly, exactly and accurately he will turn off an immense amount of correspondence, the answers having simply been talked into the phonograph. Business men in these days must perforce use them to facilitate getting through a quantity of work.

OFFICIAL REPORTER SUPERIOR COURT,
Fresno County, Cal.
FRESNO, Sept. 9, 1891.

Editor PHONOGRAM,
Room 87, World Building,
New York City.

DEAR SIR:

I have for quite a time thought that the phonograph ought to be, properly managed, a great deal of help to me in my business, and wrote for latest information in regard to it, but received no response. I would like to know the name and address of the Pacific Coast agent, if there be one.

Also a reply to the following queries, if not too much trouble.

Q. 1st. Rental per annum of phonograph?

Q. 2d. From whom I can obtain one?

Q. 3d. Cost of cylinders each?

Q. 4th. How many words cylinder contains usually?

Q. 5th. How often cylinder may be used?

Q. 6th. Would motor propelled by water from city mains furnish power requisite in a satisfactory manner?

Q. 7th. Or can electric battery be obtained that will answer same purpose properly, and approximate cost of same and cost of maintenance per month?

Q. 8th. Are phonographs used by official reporters in the East to any considerable extent in transcription of court work?

I inclose one dollar for THE PHONOGRAM for one year. Would be obliged for any additional information, aside from that covered by answers to the above questions, respecting the phonograph, and as early reply as convenient will be appreciated.

Respectfully,

J. W. G.

ANSWERS TO ABOVE QUESTIONS.

A. 1st. The phonograph can be rented for \$40 per year. In your territory, however, the machine is for sale, price \$150.

A. 2d. You can obtain all information from the Pacific Phonograph Company, San Francisco, Cal.

A. 3d. The cost of cylinders is 25 cents apiece, and \$2.50 per dozen. The musical cylinders vary in price: Band music, \$1.50 apiece; vocal and instrumental, \$1.50, \$1.75, and \$2 apiece.

A. 4th. The cylinder may be used a great number of times, the phonograph having an automatic attachment which pares off the cylinder after the first impression has been transcribed. A cylinder usually contains from 500 to 800 words.

A. 5th. A motor propelled by water is quite as satisfactory in its results as an electric motor, and

we know of several instances where the phonograph is run by water-motors entirely.

There are many batteries, both primary and storage, for running the phonograph. The Edison Lalande battery, which is a primary battery, is especially adapted for running the phonograph. The four "T" cells, nine hundred ampere hours, will run a phonograph continuously for two hundred and eight-five hours. The cost of running an Edison Lalande battery is from \$2 to \$3 per month, continuous use. Next month we shall be able to publish an account of the Euholm Primary Battery of which electricians are predicting wonderful results. Storage batteries can be used if preferred, the cost of storing a cell depending upon the locality of the user of the phonograph. If out of town, where battery service is not established, and the cells are charged one at a time, the cost would be \$2 each per month, but in a large town where a number of cells can be charged at once, the approximate cost of each would be from forty to fifty cents each.

A. 6th. The phonographs are used by many official reporters in this section of the country for transcription of their work.

Note in the April issue of THE PHONOGRAM the testimonial of D. T. Murphy, official reporter of the United States Senate. This is but one of the hundreds of testimonials received in praise of the phonograph.

ST. LOUIS, Mo., Sept. 28, 1891.

PHONOGRAM, New York:

In your last issue you numbered our company among those who were authorized to sell phonographs, etc. This is an error, as we as yet have not applied for permission to sell machines. Will you kindly correct this error in your next issue?

Yours truly,

J. C. Wood,
General Manager.

We are in receipt of the latest list of musical records manufactured by the Columbia Phonograph Company, of Washington, D. C. This is the largest list ever presented. It contains very many new selections. The total number of records, in stock and classified, is four hundred and nineteen. There are one hundred and seventy-two selections by the celebrated United States Marine Band; thirty-eight by the Third Artillery Band, U. S. A.; twenty one by Mr. John Y. A. Lee, the Artistic Whistler; forty-six vocal and piano; thirty-five vocal and orchestral; nineteen clarinet and piano; twenty cornet and piano; twelve by the Brilliant Quartet; fourteen auctioneer records, and forty-two recitations.

Reliable Motive Power Essential for the Phonograph.

We invite the especial attention of our readers to the communications appearing in this issue on the subject of storage batteries for the phonograph. Reliable motive power is absolutely essential to success, and the development of this branch of the enterprise is work to good purpose.



MAKE THE PHONOGRAPH CONVENIENT.

By EDWARD D. EASTON, *President Columbia Phonograph Co.*



It should be the constant effort of the managers of phonograph companies to so arrange office phonographs as to insure the greatest convenience and ease of manipulation by both principal and clerk.

Busy men, accustomed to calling a stenographer and dictating without leaving their chairs, are sometimes embarrassed in the use of the phonograph, because before beginning they are obliged to gather up their correspondence, leave their desk, go to and open the machine, put on the speaking-tube, hunt up a pared blank (or, worse still, pare one), and, in short, undertake the entire operation in the most inconvenient way.

Phonographs should, where possible, be used in pairs. One should be let into the desk of the principal, far enough back to leave room for spreading out the letters to be answered or signed, but not to exceed

fifteen or sixteen inches from the front edge of the desk. The other should be constantly at the service of the clerk, for transcribing and *paring*. If the office is thus equipped, there will be little temptation to return to old methods; less still, if the clerk is careful to keep within easy reach of the dictator a supply of pared blanks, and sees to it that on his arrival he finds his machine with speaking-tube and blank in position, ready to record at once the utterances of the day.

In our territory we have the following system: Three boxes, each to hold twelve cylinders, are used, the first bearing a label marked "Blanks" and containing twelve; the second empty and marked "To be transcribed;" the third box empty and marked "To be pared." The dictator is instructed to draw from the box marked "Blanks," placing each cylinder as he fills it into the box marked "To be transcribed," which box is drawn from by the type-writer operator; the latter being taught to place all transcribed cylinders in the box at his desk marked "To be pared," which *paring* he does at the first

convenient opening, returning the pared cylinders to the principal's box marked "Blanks." In this way the principal is continually kept supplied with pared blanks, the transcriber takes his cylinders in order and writes them out, and all friction is overcome from the very start. Unless some such method be suggested or em-

ployed, things will always be at sixes and sevens. papers, etc., were all in position. It can not be approached by the dictator with confidence and without care, for it may just have been used with high speed for paring, or with reproducer and hearing-tube for transcribing.

Where two machines are used the greatest convenience is secured (as in Fig. 1).



FIG. 1.

ployed, things will always be at sixes and sevens.

If the same phonograph is used for both dictation and transcribing, it can not conveniently be, as it should, on the principal's desk, as in that case he would have to surrender the desk to the clerk for the transcribing. It can not be turned to at any moment for dictation, because it may be in use by the clerk, whom it would take some little time to displace, if type-writer,

The dictator may keep his phonograph ready for instant service, with blank and speaking-tube on, recorder set, and nothing to do but start the motor and talk. He need not brush the cylinders, when filled, but may stand them on their pegs as they come from his machine, and let the transcriber, whose time is less valuable, relieve him of this and all other details possible.

Brushing by the amanuensis is advocated for another reason also: that unbrushed

cylinders, covered with particles of wax, have distinctive characteristics, and themselves indicate to the clerk that they await his attention. If the clerk, dealing with a number of cylinders at a time, brushes each before writing it, the work remaining is readily and certainly identified, and there is no danger of transcribed and untranscribed cylinders getting mixed. If the unbrushed cylinders are handled by placing the two first fingers inside (not the thumb) and the wax dust is not rubbed into the fine

But the most potent argument in favor of two phonographs, and one that all must appreciate, is this: That the dictation and transcribing go on at the same time with great economic results (as in Fig. 2). If a stenographer is used, he must take shorthand notes till the dictation is over, no matter how prolonged. One phonograph is an improvement upon the stenographer, because the dictator can alone accomplish what formerly took two persons—one to speak and the other to record; and the time of the



FIG. 2.

record-grooves, no harm will come from their so remaining for hours or even days.

The phonograph should be set to run at about sixty or seventy cylinder revolutions per minute. All users want as much word-capacity as possible on each cylinder. Word-capacity and speed of revolution have exact relation to each other. The slower the speed, the greater the word-capacity. At seventy revolutions per minute the cylinder will hold just twice as many words as at one hundred and forty. A good rule is to run as slowly as possible, and at the same time secure regular motion. Some phonographs will run at regular speed slower than others.

clerk, previously required for note-taking, may be better employed.

If, however, two phonographs are used, the clerk begins to transcribe as soon as the first cylinder is dictated (the principal meanwhile proceeding to fill others), and, by working rapidly, the writing-out may be well advanced when the dictation is done.

If paring and brushing are provided for as here advised, and if the phonograph of the principal is conveniently located and always ready for use, with plenty of blanks at hand, it is unlikely there will ever be an unfavorable verdict against the great value of talking-machines as time and money-savers in the office.

THE INDUSTRIAL EXPOSITION IN PITTSBURG, PA.



THE Third Annual Industrial Exposition, Pittsburg, Pa., opened with great *éclat* on Wednesday, September 2d, and in point of attendance surpassed all previous years.

There was a large excursion over the Fort Wayne Road, and special excursions on a number of lines were run during the month.

Cappa, the famous leader of the Seventh Regiment Band, was present with his entire corps, and from the ovation he received it is evident that he made a good impression. Cappa has boxes and boxes of music, and is anxious to please the public.

Among the exhibits we noticed the superb exhibition of the Oil Well Supply Company, who have a keen perception of what is valuable, not only from a moneyed standpoint, but as a matter of education. Also the magnificent furniture exhibition of Messrs. Hopper Bros. & Co.

But the most attractive and enterprising exhibition this year, and the one around which the crowd thronged incessantly, was the exhibits of phonographs and graphophones made by the Western Pennsylvania Phonograph Company. The crowd around the machines has been tremendous at all times through the day and evening, a new arrangement on the instruments adding greatly to the pleasure of those who wished to enjoy and understand these wonderful pieces of mechanism.

Those who desired to ascertain its degree of usefulness to a business house examined at leisure the phonograph for commercial purposes, without being jostled or

hurt by the crowd. Several of these machines stood ready to be dictated to in any language, and upon any subject, and a competent and expert operator on the typewriter was at the service of the business public, to transcribe on the spot the words inscribed on the recording cylinder.

In another portion of the department a multitude stood listening to the strains of music as heard from the wonderful automatic phonograph, whose repertoire included the best band music, vocal whistling and singing by the most famous musicians of the country. The Western Pennsylvania Phonograph Company certainly received a lion's share of approbation, and deservedly so.

We quote the following from the *Pittsburg Chronicle-Telegraph*, one of the leading and wide-awake publications of that enterprising city:

"These phonographs are the wonder of the age, and business houses can not afford to be without them. The convenience of being able to talk into them at one's leisure, either for dictation or for future reference, their value in giving the most perfect accent for the benefit of those learning foreign tongues, the ability to provide rare specimens of oratory, or to enjoy music as rendered by soloists or full bands, places this invention upon a plane which nothing else has yet reached, and the fact that they can be rented by the year (for they are not on sale in this State) for a reasonable price, and that these machines are so simple and so easily manipulated, seems to render the renting of one of them necessary.

"The Western Pennsylvania Phonograph Company had its display surrounded all the time; some listening to music, others entertained by some interesting lecturer, while the solid business men of the community were examining them pre-

paratory to renting them for their offices, to facilitate, as they will, the greatest amount of correspondence in the shortest space of time. No office will for the future be complete without one of them, and the person to transcribe the letters on the type-writer can do the most satisfactory and exact work, a convenient device enabling him to stop the machine at any point or cause it to repeat a word or sentence as often as desired."

THEIR VOICES RECORDED.

Recently a *Leader* (Cleveland, O.) reporter had the unusual, not to say weird, experience of hearing the voice of a man long since dead. The voice was that of Horatio Perry, a centenarian who passed away over a year ago, and it was reproduced perfectly through the agency of a phonograph.

In January, 1890, Mr. Arthur Smith, the genial manager of the Ohio Phonograph Company, of Cleveland, O., visited Wellington, the home of Mr. Perry, taking a phonograph with him. It was suggested that the venerable gentleman talk into the instrument, and Mr. Smith readily assented.

Mr. Perry was requested to relate an incident of his early life, and this is what he said into the mouthpiece of the phonograph:

"I was born in 1790, and came to Cleveland in 1806. There was but one frame house in the village, and my father purchased it. There was no road west of the Cuyahoga River, and nothing there save woods. 'All the days of my life will I wait.'"

The last sentence is a Scriptural quotation that Mr. Perry greatly admired. Mr. Smith brought the cylinder used for Mr. Perry's voice to this city and locked it up in his safe, where it remained. Mr. Perry died not long after he spoke into the phonograph, and Mr. Smith kindly gave the re-

porter the first opportunity of listening to the marvelous reproduction. The voice was as natural as in life, and the pronunciation was clear.

"Would you like to hear ex-President Hayes talk?" asked Mr. Smith. The *Leader* man answered in the affirmative, and a waxen cylinder was taken from the safe and unrolled from a cotton covering. It was then placed in a phonograph, and the reporter held the transmitting tubes to his ears. This is what he heard:

"If General Sherman should die, it would be felt as a personal bereavement by all Union soldiers and by a large number of citizens. He is the most picturesque character in the American Army; an ideal soldier in appearance; original as a talker and writer, speaking straight from his heart the thoughts that are in his mind. He has probably said more things and written more things that have been quoted and remembered than any other public man in his day."

General Hayes spoke the above the day before the death of General Sherman.

LET OTHERS TAKE WARNING.

A Curious Suit About a Talking-Machine That will Interest our Readers.

The case of the New York Phonograph Company against George M. Rogers has not yet been decided. It was set down for trial on July 8th, but through sickness and other causes has been adjourned from time to time.

During last winter, George M. Rogers, who resided in Philadelphia, gave exhibitions at fairs, bazaars and the like, with a phonograph which he had rented from the New York Phonograph Company. While engaged in this work, the New Jersey Phonograph Company, acting for the New York Phonograph Company, had a writ of replevin served on the machine, and it was seized.

After renting the machine, Rogers went

from New York to Philadelphia, where a replevin was served on the machine by the Eastern Pennsylvania Phonograph Company. Rogers recovered the machine by giving bonds. He went to Trenton while the suit was still pending in Philadelphia, and the attorney for the New Jersey Phonograph Company replevined it in Trenton.

The machine was delivered to the rightful owners, who are the New York Phonograph Company. Plaintiffs claim that Rogers had no right to take the machine away from New York for one year.

The rules in regard to territorial rights are very strict, and should be thoroughly enforced.

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The Phonograph as Represented at the Montreal Electric Light Convention.

The most successful convention in the history of the National Electric Light Association was held in Montreal, beginning September 7th and closing September 11th. The attendance was large, and the discussions were full of useful suggestions.

The courtesies and the hospitable greetings received from the citizens of Montreal made a thoroughly agreeable impression upon the American visitors. The hotel accommodations were unusually satisfactory, and the exhibits of commercial electrical appliances large.

The meetings of the Association were held in the Windsor Hotel and the exhibits in the Victoria Rink, which had been gaily decked for the occasion.

The successive signals for starting the exhibition were given by the young daughter of Professor Bovey, of the McGill University, and as the many-colored lights suddenly blazed forth, the brilliancy of the picture was magnificent.

Lord Stanley, Governor-General of Canada, honored the exhibition with a visit on Thursday, accompanied by Lord Kilcourse and the Honorable Mr. Spring Rice, of the British Legation at Washington.

The display of the Edison General Electric Company, in charge of the enterprising managers of the Canadian District, under the supervision of Mr. Barr, was particularly unique and attractive. Besides every variety of electrical appliance, the Edison incandescent electric lighting system overhead and underground was a special feature.

But what most attracted the people were the wonderful Edison talking-machines, under the careful and successful management of the Montreal agents of the North American Phonograph Company, Messrs. Holland Bros. & Young.

These gentlemen had a very handsome room fitted up with various cabinets, upon which were placed a large number of phonographs, the six way-hearing tubes being attached. A portion of the room was set aside for the commercial phonograph, which demonstrated its business uses in connection with the type-writer. This exhibit attracted more attention than anything else at the convention, the room being so constantly thronged both day and night that the services of a half dozen policemen were required to keep the throng moving. The expressions of wonder and delight could be heard on all sides.

THE PHONOGRAM was read with much interest, and for the first time in the history of this enterprise did the public begin to comprehend the vast resources centered in this marvelous piece of mechanism.

Professor Bovey, of the Science Department of the McGill University, was presented with a phonograph by Messrs. Holland Bros. & Young.

These gentlemen are placing a large number of machines in the Canadian territory.

It was estimated that from four to five thousand people visited the exhibition each day. The parade on the Champ de Mars was a complete success, and very largely attended. The visitors were shown the ladder-drill. It was a marvelous feat of

dexterity in climbing to a fifth-story window with a life-saving apparatus.

The conversazione at the McGill College was also a grand success. A large tent was erected on the grounds of the college, around which was tastefully arranged tables freighted with the choicest edibles.

A band of twenty-five pieces was stationed in one corner of the tent, which rendered delightful music throughout the evening. A large banquet was given by the citizens of Montreal on Thursday evening at Windsor Hall. His Excellency the Governor-General of Canada occupied the place of honor at the banquet, while Sir Donald Smith presided, with President Huntly on his left.

"THE BUSINESS PHONOGRAPH."

Its Points of Advantage.



THE *Electrical Engineer* of a recent date contains the following article, by Mr. Frank R. Colvin, on "The Phonograph in

Business," in which the writer points out some of the many advantages of this machine, which he believes to be quite unappreciated by the majority

of business people. It is generally regarded, he thinks, rather in the light of an ingenious toy than a really valuable adjunct to the working force of an office.

The great advantage of the phonograph in office-work is, of course, in the transmittal of letters at a time when the stenographers are otherwise occupied. By using the phonograph for dictation during the last hour of the day, material for correspondence is ready for transcription, and can be in the hands of the type-writers while the morning mail is being handled,

and before the new duties of the day are entered upon. Besides the regular office correspondence, there are special conditions under which the phonograph does valuable work, as in the following instance:

"Whether I am in Philadelphia, Washington, or Baltimore, in Erie or Buffalo, in Rochester or Boston, the morning mail is read to me over the long-distance telephone from New York by one of our stenographers, and the answers taken down in shorthand at the New York end of the wire. Ten minutes after I hang up the telephone in Buffalo or Washington, the stenographer is reading his 'overflow' notes into the phonograph for distribution, and the mail, dictated over a wire from two to five hundred miles long in the morning, goes out of the office in the evening, just as though I had been there all day. This is not a *dream* or a *future possibility*; it is *what is done* in this office as frequently as absence makes it necessary, and what many more houses are doing from day to day as the advantages of modern electrical facilities are more appreciated and understood.

"These suggestions are certainly sufficient to convince any one that the phonograph is, or is capable of being, a really important factor in certain lines of business. It is no more than fair that its availability should be understood and appreciated."

SOUND VIBRATIONS.

A Hint From the Deaf.

Edison is finding out some new secrets about sound vibrations every month. His phonic inventions are the utilization of sound vibrations—one to communicate them, another to impress them on a wax cylinder. It is highly probable that the deaf can throw some light upon the mysteries. Their experiences are altogether different from those who can hear. They detect the presence of sound in the air through the nerves, but the degree in

which they feel the vibrations depends upon where they stand or sit. A wooden building or a wooden floor echoes with sound. A stone floor will not communicate sound to them. Again, in a silent street they know when a wagon is passing, and sometimes can tell what sort of a wagon it is. But in a crowded street, where many vehicles are passing, they are not able to distinguish the sound of one or all of them. They can not distinguish the roar of traffic in lower Broadway, or streets like it, for instance.

The heavy stone pavements are perfect non-conductors. And yet everybody knows that a policeman summons assistance by rapping his club on the pavement. How do you explain it? I know deaf men can recognize and distinguish individuals by the vibrations of their footfalls on a floor.

A CURIOUS PROPHECY.

How Commodore Maury Described a Talking-Machine Fifty Years Ago.

Nearly fifty years ago the late Commodore Maury, in a jesting mood, spoke of recording human speech by speaking through a trumpet upon a sheet of paper, and in a general way described the phonograph or graphophone. This curious prophecy, made in joke, was discovered the other day by Dr. G. B. Goode, Director of the National Museum, in looking over the life of Commodore Maury, recently published in London. It is contained in a letter written by Commodore Maury to a relative in New York, dated May 12th, 1844. At that time Commodore Maury was superintendent of the naval observatory in this city. If Commodore Maury had been alive and present when Professor Goode read this letter he would have been astonished to see what the professor did. He turned and took up a trumpet and talked into it. He was speaking, not upon a piece of paper, but upon a light wax cylinder. When he had finished this

cylinder, he inclosed it in a little case or pasteboard box and mailed it to Mr. E. D. Easton, the President of the Columbia Phonograph Company, of this city. Mr. Easton put the cylinder on a graphophone, adjusted the ear-piece to his ear, and then read what Mr. Goode had written on the cylinder. It was a copy of Commodore Maury's letter, in which he wrote:

"What a pity it is that Monsieur Daguerre, instead of photography, had not invented a process of writing by merely speaking through a trumpet upon a sheet of paper. What a glorious thing it would have been! I could then have mailed out letters in the boldest hand and at any time. Instead of saying, 'I wrote you a letter last Monday,' the phrase would have been, 'I spoke you a ream last Tuesday.' The world would become a vast scribbling shop—a vast book machine. When out visiting, and you wished to give the cook an order, you would only have to call down the pipe, and the cook would have a written order at her feet, and then there could be no mistake about the pudding. What a convenience that would be to housekeepers! Such a consummation, though, must be left to the generation of our children. It would be a curious thing if they were to carry on their courtship in this way."

Publisher THE PHONOGRAM.

DEAR SIR:

In accordance with previous intimation, we desire this month to increase our advertising space from half a page to a page.

THE PHONOGRAM is the best existing advertising medium for phonograph companies. We mail copies monthly, at our expense, to all of our subscribers, and have done so from the beginning. In this way we not only keep them advised of precisely what we are doing from month to month, but receive a distinct advantage through the general educational work of the magazine.

Yours truly,
E. D. EASTON,
President.

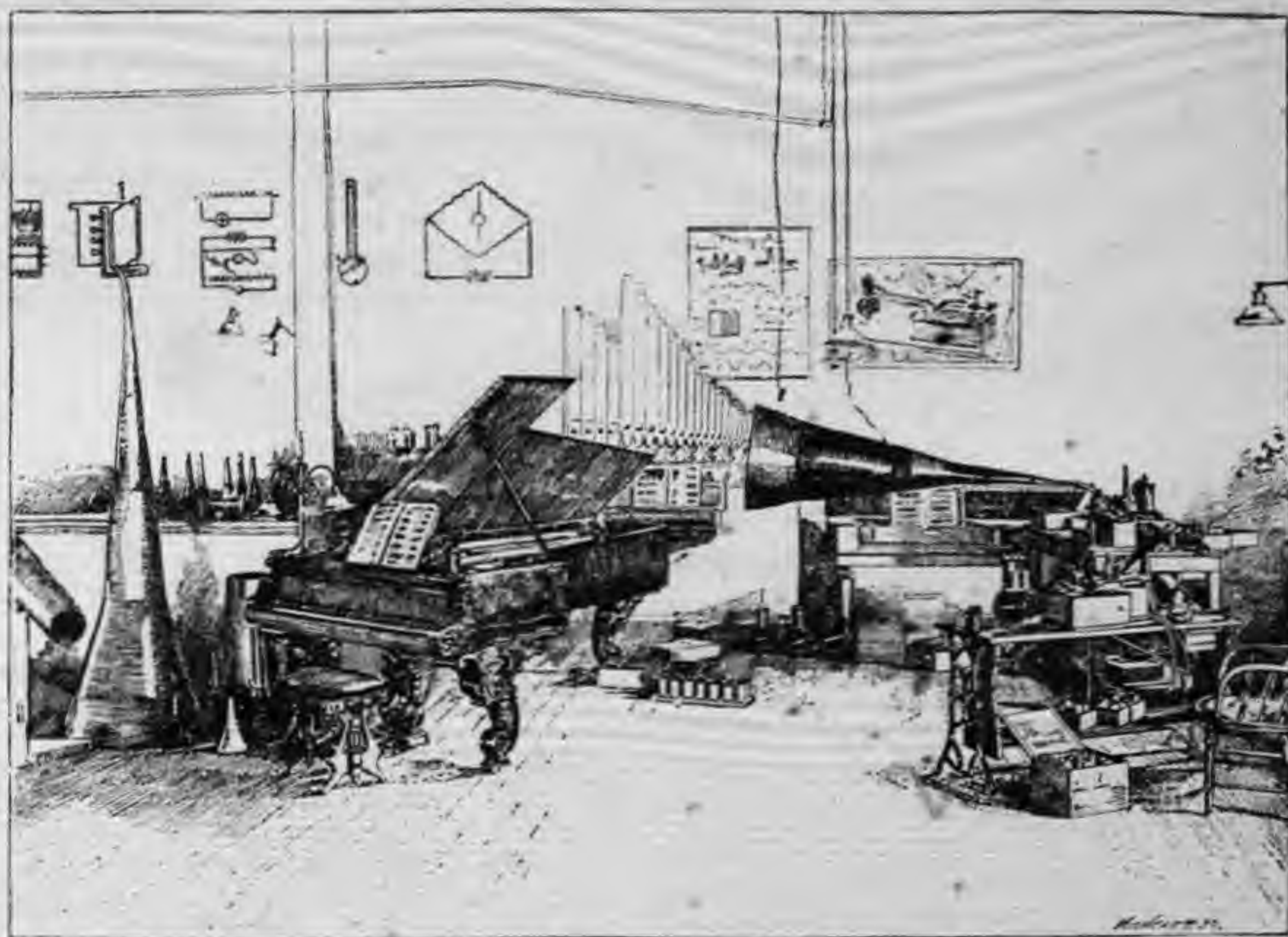
CHARGING THE PHONOGRAPH.

How the Bands Play and the Singers Sing into the Phonograph.

So much has been said in regard to tracing the music on the phonograph cylinders, and so many people are puzzled as to how the phonograph reproduces music and songs, that we furnish the following description and cut in order to enlighten those persons who are not familiar with the process, the general idea being

theater or concert hall, and many of the finer tones, both instrumental and vocal, would be lost.

The manner in which the music rendered by the phonograph is obtained is this: A large room is set apart, so arranged that no noise can be heard from the outside, and the floor is protected so that even the



that we go to the theater or concert hall where a man plays or sings, and catch him on the fly, so to speak, with a receiving phonograph.

This would be possible, but under the very best conditions the results would be unsatisfactory. The receiving instrument will take in everything, even to the noise made by persons going in or out of the

sound of your feet walking over it can not be audible. In this room there are a dozen or more receiving funnels shaped very much the same as the big funnels you see in wholesale liquor stores.

Supposing the number is instrumental, such as "Lovers' Farewell," played by Gilmore's Band, or the "Phonograph March," played by the United States Ma-

rine Band (the President's own). The principal members of these bands stand in front of the funnel so that the full volume of sound is delivered into them. When it is a song by some favorite singer, he sings into the phonograph the same way. There is no reasonable limit to the number of times the air can be reproduced all over the world by the playing or singing one time in the phonograph.

The accompanying sketch is taken from one of the music-rooms of a phonograph company, and gives a good idea of the arrangement of the receiving funnels placed in position to receive instrumental music.

A TRIUMPH IN STORAGE BATTERIES.

THE COLUMBIA PHONOGRAPH COMPANY, OF
MARYLAND, DELAWARE AND THE DISTRICT
OF COLUMBIA.

PRINCIPAL OFFICE:

627 E. STREET, N. W. WASHINGTON, D. C.

Editor of THE PHONOGRAM:

The Columbia Phonograph Company realized early in its career that efficient and absolutely reliable battery service was indispensable to the success of the phonograph. Our efforts to secure such service have been unremitting, and our determination has always been to stop at nothing short of complete triumph.

Busy men will not use the phonograph commercially if there is much friction in regard to power. Automatic service can not be properly maintained if the battery question does not receive careful attention.

We were fortunate, in the beginning, to enlist the co-operation of Mr. W. W. Donaldson, of the Johns-Hopkins University of Baltimore. More than two years ago Mr. Donaldson began studying the subject. He was then an electrician of experience, but storage batteries were in their infancy. Mr. Donaldson at once became the electrician of the company, and it is no more than justice to say that he stands at the head of his profession so far

as the application of storage batteries to the phonograph is concerned.

As will be seen from Mr. Donaldson's letter, published in this issue of THE PHONOGRAM, we have secured absolutely reliable battery service. Our subscribers are not embarrassed by exhaustions and failures of power, for the reason that we change all cells in the territory at least every two weeks; oftener in a few cases where extraordinary demands are made upon the battery.

We have not, however, secured this service without both trouble and expense. To change more than four hundred batteries with regularity is of course a considerable task.

Neither Mr. Donaldson nor the company has been satisfied with this situation, and constant efforts have been put forth toward improvement, not so far as the users of the phonograph are concerned, for they are fully protected, but on our own account.

The batteries we have used are open, from our standpoint, not only to the objection of quick discharge—the average being from forty to fifty hours of phonograph work—but also to rapid deterioration of elements, making the service to us extravagant, from a financial point of view.

We are now happy to say, after practical tests which leave no doubt of the facts, that we have secured a storage battery no larger nor heavier than those we are using, which can be absolutely depended upon for one hundred and fifty hours of phonograph work, and is so durable and inexpensive to maintain that, in our judgment, it must prove a highly economical substitute for all other known types. Office tests have given as high as one hundred and sixty hours of phonograph service.

Hereafter it will be necessary for us to change batteries six times a year instead of twenty-four times, and practical men will see at a glance what a vast step forward this is in storage battery work.

We are glad to say, in a general way, that the new battery has all the points of advantage of the old accumulator, coupled with the great additional advantages stated.

STORAGE BATTERIES IN PHONOGRAPH WORK.

BY WM. W. DONALDSON, *Electrician Columbia Phonograph Co. and President
Donaldson-McRea Electric Co.*



2

IN September, 1889, I rented a phonograph and a primary cell.

The primary cell causing me trouble, and having an old-style "Julien" accumulator, "15 B" type, in my house for sewing-machine work, I attached the secondary cell to the phonograph. Of course it worked like a charm, and ran for some weeks. This gave me the idea of using storage batteries for general phonograph work. I at once went to the Columbia Phonograph Company and offered to supply all their machines with electricity at a definite price per motor, guaranteeing to keep all machines running and to change the batteries as often as was required.

I soon started work on this basis, and in a short time almost all the treadle machines in use were exchanged for motor service, and the total number of machines rented greatly increased by the sure and efficient service rendered by storage batteries.

My system is a very simple one, and after two years' working has proved itself to be sure. Take Washington as an example. The city is divided into twelve sections, approximately the same number of subscribers being in each section. Every storage battery in the twelve sections is changed once in two weeks. Each section has its day, and the batteries brought in on one are overhauled, charged the same night, and delivered to next section the following day.

There are slips for each cell delivered,

with space for date, signature and address of subscriber, and for special report. Thus a complete record is kept of each subscriber's electrical account. A special list is kept for experimental, weekly, and exhibition machines.

The reason for making the changes every two weeks is that the multiplicity of plates required in a battery of sufficient size and capacity to last for a longer period brings in the element of uncertainty, which must for successful work be avoided.

The Columbia Phonograph Company has aided me in every way to perfect my system, and I think we can claim the right of having been the first to establish such a thing in connection with the phonograph.

At present I have in use over four hundred storage cells for this work alone. We are now introducing a new phonograph cell by which we expect to raise the efficiency of our service to the highest point of excellence.

The descriptive price-lists of the North American Phonograph Company are contained in colored and beautifully bound books or pamphlets, which it is a pleasure to inspect, on account of the full information they give of the instrument whose merits they set forth, as well as the excellent typographical garb in which they are presented to patrons and the general public.

Mr. T. R. Lombard, Vice-President of the North American Phonograph Company, is about to make a tour of the South-Western States, during which he will create agencies for the sale and rental of the phonograph.

UTILIZING THE PHONOGRAPH TO FORMULATE A SIMIAN LANGUAGE.



ROF. F. L. GARNER

writes as follows to
the *New Review*
(London) for June:
I have long believed
that each sound ut-

tered by an animal had a mean-
ing which any other animal of
the same kind could interpret
at once. I regarded the task of
learning the monkey tongue as

very much the same as learning that of a
strange race of mankind—more difficult in
the degree of its inferiority, but less in vol-
ume. Year by year, as new ideas were reveal-
ed to me, I began to realize how great a task
was mine. One difficulty was to utter the
sounds I heard, another was to recall
them, and yet another was to translate
them. At last came a revelation. I went
to Washington and proposed to Dr. Frank
Baker, Director of the National Zoological
Garden, the novel experiment of acting as
interpreter between two monkeys. The
plan was quite simple. We placed in sepa-
rate rooms two monkeys that had been
caged together. A phonograph recorded a
few sounds uttered by the female. When
the male heard these sounds repeated, his
surprise and perplexity were evident. He
traced the sounds to the horn from which
they came; he thrust his hand into the
horn, withdrew it, and peeped into the
horn again and again. Having satisfied
myself that he recognized the sounds as
those of his mate, I proceeded to record
some of his sounds, but my success was not
fully up to my hopes; yet I secured from
him enough to win the attention of his
mate, and elicit from her some signs of
recognition. And thus, for the first time

in the history of philology, the Simian
tongue was reduced to record. I also se-
cured phonographic records in the Chicago
Zoological Garden, and in the Cincinnati
Garden. I studied these, repeating them
over and over, until I became quite fa-
miliar with the sounds, and improved my
utterance of them. Some weeks later I
returned to Cincinnati and Chicago, and
tried my skill as a linguist with a success
far beyond my wildest hopes. I stood by
a cage containing a capuchin monkey. I
uttered the word, or sound, which I had
translated "milk." On repeating it three
or four times he answered me very distinct-
ly with the same word, and then turned to
a small pan kept in the cage for him to
drink from. I repeated the word again,
and he placed the pan near the front of the
cage and uttered the word. I gave him
some milk, which he drank with great zest;
then he held up the pan and repeated the
sound some three or four times. I was
quite sure he used the same sound each
time he wanted milk. I now held a ba-
nana in front of the cage, and he at once
gave the word which I had translated "to
eat." Repeated tests proved to me that
he used the same word for apple, carrot,
bread, and banana, hence I concluded that
it meant "food" or "hunger," as also
"to eat." From other experiments I was
convinced that the word I had translated
"milk" must also mean "water," and
also "drink," and probably "thirst." I
have never seen a capuchin monkey that
did not use these two words. The sounds
are very soft and quite flute-like; very
difficult to imitate, and impossible to write.
They are purely vocal, except faint traces
of "h" or "wh" as in the word "who;"
a very feeble "w;" and here and there a
slight guttural "ch." To imitate the

word which I interpret "food," fix the mouth as if to whistle; draw the tongue far back and try to utter the "who" by blowing. The phonics appear to me to be "wh-u-w," with the consonant elements so faint as to be almost imaginary. In music the tone is F sharp, and this seems to be the vocal pitch of the species, though they have a wide range of voice. The sound I have translated "drink," or "thirst," is nearly uttered by relaxing and parting the lips, and placing the tongue as it is found in ending the German word "ich," and then trying to utter "ch-e-u-w," making the "ch" like "k," blending the "e" and "u" like slurred tones in music, and suppressing the "w." The consonant elements can barely be detected, and the tone is about an octave higher than that used for "food." My work has been confined chiefly to the capuchin monkey, because he seems to have one of the best defined languages of any of his genus. I have recorded one sound made by the sooty monkey, three by a mandril, five by a white-faced sapajou, and a few of less value. But from the best proofs I have found I have arrived, as I believe, at some strange facts: 1. The Simian tongue has about eight or nine sounds, which may be changed by modulation into three or four times that number. 2. They seem to be half-way between a whistle and a pure vocal sound, and have a range of four octaves, and, so far as I have tried, they all chord



with F sharp. 3. That sound used most is very much like "u" — "oo" in "shoot." The next one something like "e" in "be." So far I find no a, i, or o. 4. Faint traces of consonant sounds can be found in words of low pitch, but they are few and quite feeble. 5. The present state of their speech has been reached by development from a lower form. 6. Each race or kind has its own peculiar tongue, slightly shaded into dialects, and the radical or cardinal sounds do not have the same meanings in all tongues. 7. The words are monosyllabic, ambiguous, and collective, having no negative terms except resentment. 8. The phonic character of their speech is very much the same as that of children in their early efforts to talk, except as regards the pitch. 9. Their language seems to obey the same laws of change and growth as human speech. 10. When caged together one monkey will learn to understand the language of another kind, but does not try to speak it. His replies are in his own vernacular. 11. They use their lips in talking in very much the same way that men do. 12. I think their speech, compared to their physical, mental, and social state, is in about the same relative condition as that of man by the same standard. 13. The more fixed and pronounced the social and gregarious instincts are in any species, the higher the type of its speech. 14. Simians reason from cause to effect, and their reasoning

differs from that of man in degree, but not in kind. To reason, they must think, and if it be true that man can not think without words, it must be so of the monkey; hence, they must formulate those thoughts into words. 15. Words are the audible, and signs the visible, expression of thought, and any voluntary sound made by the vocal organs with a constant meaning is a word. 16. The state of their language seems to correspond with their power to think and to express their thoughts. I have here given only a few of many trials which I have made to solve the problem of the Simian tongue, and while I have gone only a step, I believe that I have found a clew to the great secret of speech, and pointed out the way that leads to its solution.

WHAT WILL BE.

Looking through the spectacles of Mr. Edward Boissgilbert, we see in the year of grace 1991 our good city of New York in a new light. In his book, entitled "Caesar's Column," he says:

"As we approached the great city in our great air-ship, coming from the east, we could see, one hundred miles before we reached the continent, the radiance of its millions of magnetic lights reflected on the sky like the flare of a great conflagration. These lights are not fed, as in the old time, from electric dynamos, but the magnetism of the planet itself is harnessed for the use of man. That marvelous 'earth force' which the Indians called the 'dance of the spirits' is now used to illuminate this great metropolis with a clear, soft, white light like that of the full moon, but many times brighter, and the force is so cunningly conserved that it is returned to the earth without any loss of magnetic power to the plane. Night and day are all one, for the magnetic light increases automatically as the daylight wanes."

ARTIFICIAL FUEL.

Artificial fuel for locomotives is to be used by the Southern Pacific Company, according to the *San Francisco Enquirer*. A plant for the manufacture of artificial

brick from coal-dust and asphaltum has been purchased in England, and is now being set up in San Francisco. It will cost seventy-five thousand dollars and have a capacity of five tons of brick per hour. At present coal is a very large item of expense to the Southern Pacific Company, it being nearly all brought from Victoria by steamer. The use of this fuel is stated to have been quite successful in England, and the experiment of the Southern Pacific Company will be watched with interest.

PHONO-CHAT.

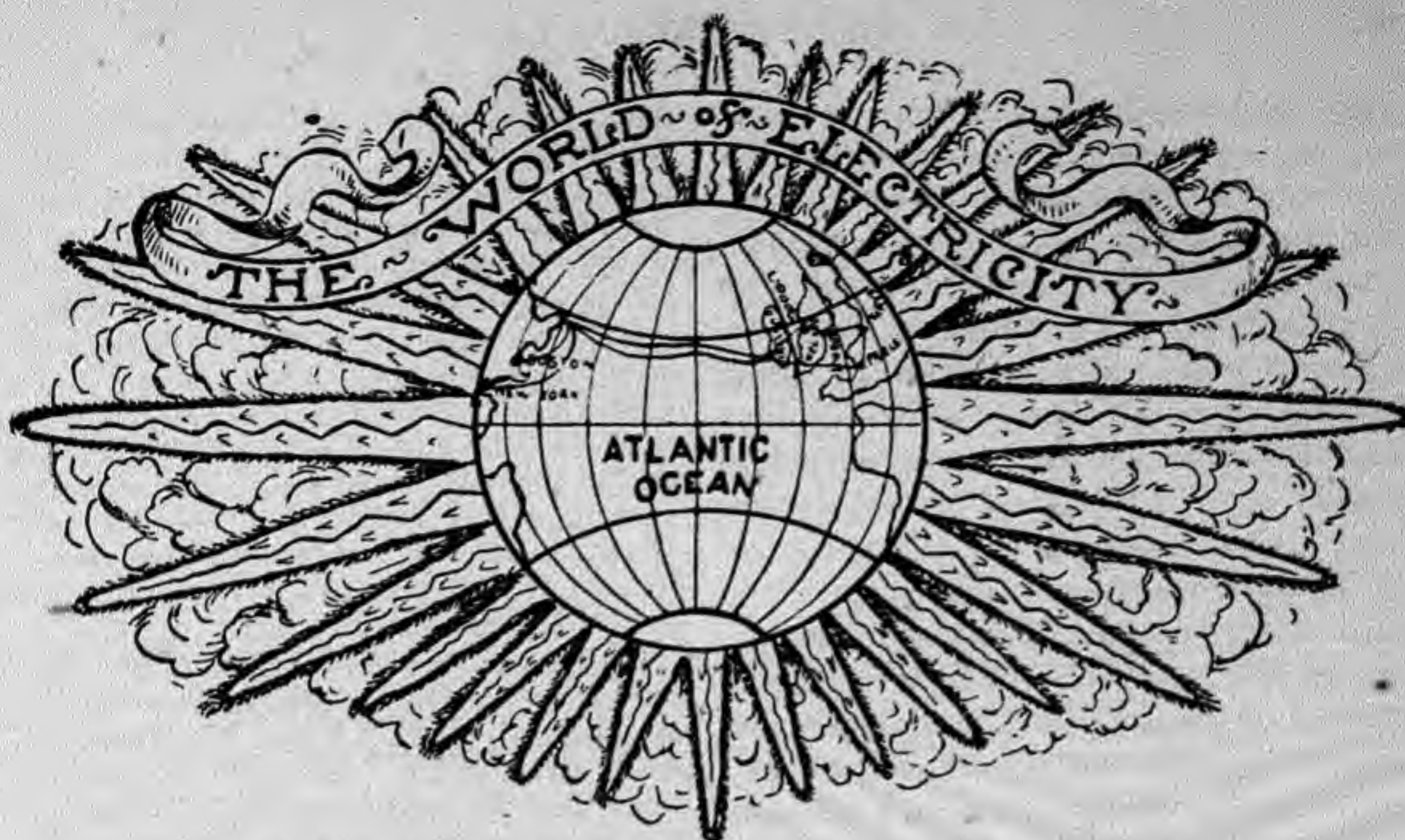
Mr. Arthur Smith, Manager of the Ohio Phonograph Company, Cleveland, O., reports that the automatic business in his territory is fully up to the mark. He has placed in the Arcade a number of very handsome automatic cases and phonographs, and keeps two men busy attending to them; and it is pleasing to note with what delight the crowds rally around them, and with what eager expectancy they look for the time to come when the "phonograph man" replaces the cylinder with new and popular airs.

The Daugherty Manufacturing Company has lately been formed, with a capital of one hundred and fifty thousand dollars. Its object is the manufacture of type-writers.

A Board of Directors have been elected, and the company will begin business at once.

NEW PROPELLER FOR STREET-CARS.

S. H. Shaw, a Kansas man, has invented a street-car motor which consists of a spring eight feet long and twelve inches wide, which is wound up in barrels twenty-six inches in diameter. Eight of these are put under each car. The outer edges of these barrels form sprocket wheels, from which run endless chains connecting with sprocket wheels on the car axles. Each spring is two-horse power, making sixteen-horse power to each car. These, it is estimated, will drive a car four miles. They are under the control of the driver, can be disconnected by the turn of the wheel, and in running down grade the springs are partly rewound. On a road four miles long a winding station, requiring an engine, would have to be set up at each end.



THE NATURE OF ELECTRICITY.

Concluded.

BY ALEXANDER JAY WURTS.



IN these and many other cases energy is transmitted in different forms of vibrating matter, but without any transmission of matter itself. It must now, however, be further observed that we are not confined to any specific vibratory motion; we may assume any wave form that shall seem to accord best with observations and known effects. For example, in the vibrating rope, the parts of the rope vibrated horizontally as well as vertically, but when an engine bumps against a freight train it is evident that the vibrations from one end of the train to the other are mostly horizontal. Again, if we place several pocket compasses in a straight or curved line, the needles will place themselves so that unlike poles point toward each other. If

now, by means of a vibrating piece of iron, we cause the compass needle on one end of the line to vibrate, all the others will do the same; energy has thus been transmitted through the medium of visible vibrations, without any transmission of matter and without visible contact of the moving parts.

Electric energy is readily transmitted through the medium of a copper wire; air arrests its progress. Why is this? Theory, based on the assumption of the ether, in connection with observed facts, attempts to answer this question. Energy, as above shown, is transmitted across the interplanetary spaces through the medium of ether vibrations. But the amount of energy transmitted from the sun to the earth is so great that, at first thought, the ability of so thin a fluid as the ether to transmit this energy might be questioned. It must, however, be remembered that these vibrations are transmitted with enormous velocity, so that what is lacking in density is compensated for by velocity.

Now, electricity and light being a vibratory motion of one and the same ether, we are confronted with the further questions, Why do heat, light and electricity manifest themselves in different ways, and why are these forms of energy transmitted with different velocities? The first of these three questions I will answer in this way: An "electric current" is supposed to be a series of ether vibrations having a wave form which meets with little assistance during its propagation through copper. I have compared ether vibrations to screws, and each kind of vibrations to a certain kind of screw, so that a propagation of electric vibrations will cut its own thread, so to speak, through certain substances with more or less ease, just as a screw will. The possible reason that the electric wave will readily travel through copper and be resisted by air is now not far to seek. May it not be that copper is so constructed that ether waves having the electric phase are readily transmitted through it, and that air is so constructed that ether waves having the above phase resist this motion? If this is so, then other substances would conduct or resist the electric wave of ether according as their structures are more or less adapted to the ready passage of an ether wave having the electric phase.

Answers to the other two questions can also be found in the assumed difference of wave phase. The three wave forms, however, of those three different forms of molecular energy must have many points in common, in that they manifest so many common properties: for example, conductors of electricity are conductors of heat, and insulators of one are insulators of the other. Light and electric induction have been found, with very few exceptions, to have the same velocity under similar circumstances. Light vibrations differ from heat vibrations in such a way that the former manifest themselves to the sense of sight and the latter to touch. In many cases both of those vibrations emanate from the same substance or source, as, for example, red-hot iron. Heat and light,

then, seem to be very similar kinds of molecular motion. If we heat a ball of iron it will at first feel warm, the vibrations will be comparatively slow and not of a kind to be detected by the optic nerve, but as the iron becomes hotter and hotter, the vibrations will become correspondingly more rapid, and we say that it is growing warmer; but presently the vibrations become so rapid and of such a character that we say the iron is red-hot. This is simply another way of saying that the molecular vibrations of the iron have assumed such a character that they affect the optic nerve as well as the sense of touch.

The theory of the nature of electricity is now this: Electricity is a wave motion of an assumed ether. When electricity does work, the form of its energy is changed. It is then no longer motion of ether, but motion of ordinary matter. Likewise, heat and light, as we receive them from the sun, are ether vibrations, and when they do work, their forms are changed in one way or another from the motion of the ether to motion of ordinary matter. When electricity is generated, the ether is distorted in such a way as to produce the electric wave, and energy is thus transformed from ordinary matter to ether, and we have electric waves or vibrations which we call the "electric current" or "electric fluid."

Transmission of Power Over Long Distances.

A new field of industry for electricians is now opened by the erection of power plants in Switzerland, Germany, England, and probably at this writing, in other countries, for the transmission of power to long distances. *The Electrical World* says:

"If at the time of the Chicago Exhibition we could point to the power of Niagara conveyed to the Exhibition grounds, and utilized to the utmost capacity of the plant, even if it should be only one or two hundred horse-power, a stimulus would be given to long-distance work that would lead to results of inestimable value. Five hundred miles, in view of the successful installation at Frankfort, is not by any means a prohibitory distance; on the contrary, more than one skilled engineer has expressed to us his entire willingness to undertake the work and guarantee its success."

THE ELECTRIC TELEGRAPH IN 1787.



N Arthur Young's "Voyages in France" (edition of Edward Betham) may be read, on page 96: "In the evening I went to Mr. Lomond's. He has made a remarkable discovery in electricity. You write two or three words on paper, which he takes with him to an adjoining room; he sets in motion a machine in closed in a cylindrical box, surmounted by an electrometer, a light ball of elder pith. A wire unites this apparatus to another similar, placed in a further chamber; his wife, who has placed herself there, interprets the movements of the ball, recognizes the words it indicates, and writes them out; the inventor has, therefore, formed an alphabet of these movements. As the length of the wire does not change the indications of the instrument, one may by this means correspond at any distance."

Employment of Electricity for Annealing Steel.

Within the space of two years the electric current is utilized in the manufacture of arms at Saint-Etienne for annealing steel wire which serves for making springs to the gun model of 1886. These springs are formed of steel wire of 0.7 millimeter, cut in lengths of 3.20 millimeter. When the steel is rolled up in proper form for springs it is submitted to an electric current of forty-five volts and twenty-three ampères, which carries it rapidly to an elevated temperature. When the proper temperature is attained the current is arrested, and the spring allowed to fall into water. A workman can anneal twenty springs in two or three minutes, and make twenty-four hundred in a day. This mode of operation

can be applied in analogous cases, being both neat and economical.

Singular Effect of a Stroke of Lightning.

From *L'Electricien* of August 22d we learn of the effect of a thunderbolt which struck a man conducting a hay-maker. The horse conducting the machine was instantly killed, but the driver, who also received a blow, remained on his seat with his head bent forward. Dr. Palmer, who was at once called in, stated that the patient had one hundred pulsations and forty respiratory movements in a minute; the pupils were dilated, the look vague and fixed, the conjunctive membrane insensible to the touch, and the muscles rigid. He gave the patient brandy and ammonia, administered hypodermically, and vigorous friction. Conducted to his home, he recovered consciousness after an agitated night. On the occiput the flesh was laid bare in a scar to the bone, extending to the nose; on the right side there was a burn seventeen by twenty centimeters wide, and a blister on the fore-arm.

Loss of memory, general prostration, and pains in the loins, together with the sound of imaginary noises, afflicted the victim for many weeks, and two and a half months passed before he could leave his bed. Even yet his intellectual faculties remained much affected, and he has not completely recovered the use of his memory.

ELECTRIC RAILROAD.

Along the water front at Liverpool, England, there is in process of construction an elevated railroad which has been under consideration for forty years. The line is six and a half miles in length, with two tracks of standard gauge, and will be provided with electric motors to impel the trains. The road skirts the principal docks, where the passenger travel is enormous.



Simultaneous Telegraphy and Telephony.

If ever a conception, after telephony itself, appeared to be Utopian, it was that of these combined systems. The possibility of its realization seemed to be as uncertain as was the probability of the success of the telephone. But in 1882 M. Van Rysselburghe obtained his patents for it, and thereafter there was no room for doubt as to its reality.

From Paris to Lyons, and in other places, this process is successfully carried on, and for simplicity the system of M. Pierre Picard is especially commended.

A NEW INCORPORATION.

A telephone company has just been formed in London, in which the Duke of Marlborough has an interest. This company will supply lines with metallic circuit service at an annual rental of ten dollars per year.

This is one of the many active enterprises which has developed since the expiration of the telephone patents.

NEW TELEGRAPH CABLE IN PROSPECTU.

The Engineering and Mining Journal informs us that a survey of parts of the

Pacific, preparatory to the laying of the proposed Transpacific Telegraph Cable, which has been conducted by Rear-Admiral Belknap, gives evidence of extraordinary difficulties to be encountered. His soundings show the existence of a trough of great depth along the coast of Japan and the Kurile Islands, where, in a run of thirty miles after leaving the coast of Japan, the waters deepened more than eighteen hundred fathoms, and upon the next cast of the lead the wire broke after forty-six hundred and forty-three fathoms had been run out, without bottom having been reached. The depth of the deepest cast—five and one quarter miles, the deepest yet found—is sufficient to hold two mountains as high as Japan's great Fusiyama one on top of the other.

ALL ABOUT METALS.

From that well-conducted periodical, *The Age of Steel*, we learn that several capitalists of the city of Memphis, Tenn., while recently journeying through the mountains of Arkansas, discovered what they believed to be a tin-bearing deposit, near Little Rock. They had some samples of the ore assayed, and it was said to yield

seven per cent. of pure tin. They state their intention of beginning the active work of developing it at once.

COPPER.

This valuable metal is about to be used for a novel purpose by a gentleman of Brooklyn. In the construction of vessels it is very generally used, but this is probably the first instance of its application to houses as a covering. The walls are composed entirely of large copper plates riveted together and bound with iron; it is not polished, and each plate makes a panel with the iron bindings. The cornices, trimmings, posts, and railings are of iron.

The Iron Trade Review tells us that a Chattanooga (Tenn.) concern now turns out three hundred tons of Bessemer steel per week. This is steady progress.

ELECTRICAL PATENTS.

THE following are especially reported for THE PHONOGRAM by Messrs. Higdon & Higdon, 36 Le Droit Building, Washington, D. C.:

ISSUED SEPTEMBER 1, 1891.

No. 458,680—Vending machine. David E. Durie and A. Begg, Seattle, Wash.

No. 458,681—Vending machine. David E. Durie and A. Begg, Seattle, Wash.

No. 458,566—Carriage mechanism for type-writing machines. James F. Frankey, Dodge City, Kan.

No. 458,567—Carriage-feeding mechanism for type-writing machines. James F. Frankey, Dodge City, Kan.

No. 458,916—Phonograph. Eustace Oxley, Boston, Mass.

No. 458,959—Type-writer cabinet. Frederick Sanderson, Chicago, Ill.

ISSUED SEPTEMBER 8, 1891.

No. 459,062—Coin-freed dynamometer. Charles A. and A. Barrett, London, Eng.

No. 459,093—Type-writing machine. Blickensderfer Manufacturing Company, New York, N. Y.

No. 459,094—Type-writing machine. Blickensderfer Manufacturing Company, New York, N. Y.

No. 459,065—Coin-freed apparatus for exhibiting optical illusions. Edmund Edwards, London, Eng.

No. 459,205—Telephone receiver. James H. Howard, Medford, Mass.

No. 459,213—Hook or crotch for telephone receivers. James H. Howard, Medford, Mass.

No. 459,214—Telephone. James H. Howard, Medford, Mass.

No. 459,149—Type-writing machine. Benjamin M. Steele, Peoria, Ill.

ISSUED SEPTEMBER 15, 1891.

No. 459,491—Making plates for secondary batteries. United Gas Improvement Company, Philadelphia, Pa.

No. 459,406—Type-writer cabinet. E. T. Baker, Bridgeport, Conn.

No. 459,447—Fibrous carbon battery. James H. Robertson, Rutherford, N. J.

No. 459,535—Secondary battery. C. P. and F. Silvey, Castleton, Ind., and M. Silvey, Dayton, Ohio.

ISSUED SEPTEMBER 22, 1891.

No. 459,930—Duplex telegraphy. John J. Ghehan, Newark, N. J.

ISSUED SEPTEMBER 29, 1891.

No. 460,123—Phonogram blank carrier. Thos. A. Edison, Llewellyn Park, N. J.

No. 460,338—Phonograph tablet. Isaac W. Heysinger, Philadelphia, Pa.

No. 460,235—Electrode for secondary batteries. John B. McDonald, Chicago, Ill.

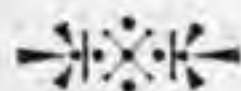
ELECTRIC LIGHTING.

The population of the city of Cambria furnished the capital necessary to construct a system for lighting that place by electricity. They decided to acquire the incandescent lamps, and all the houses are lighted with these from the garrets to the cellars. Three thousand lamps are in service.

The long-contemplated project of improving the postal service between New York and Brooklyn is now about to be put into effect by connecting the two main offices with the stations by means of pneumatic tubes. These will follow the elevated roads underneath those structures, and cross the river over the Bridge. Not placing the tubes under ground will be a great saving of expense.



A Type-writer Which is Said Will Revolutionize the Making and Selling of Machines.



WE learn that a type-writer has been invented which is said to be so great an improvement upon the one thousand and one type-writers now in existence, that its introduction will revolutionize the present method of making and selling machines.

This is an old story, with the exception of the part relating to the price. Heretofore all new machines that are above classification as toys have come in offering improvement in every way but that of cost. If the most recently announced machine is sold at a large reduction on the average price in type-writers, it will hasten the break in prices which will soon be the natural consequence of the expiration of the principal patents on the first bar-action type-writers invented. In the event of this happening, the type-writer, like the sewing-machine, will drop within the reach of people of moderate means.

A new type-writer is in the market which involves a new principle in the operation

of type-writers. It is the connection of the type-bar with the key-lever by means of cogs; the action is direct and is a downward stroke. The stroke is regulated by a universal balance which also causes the instantaneous return of the type-bar, allowing rapid action.

The carriage is released by an escapement movement not unlike that of a watch. A small number of parts, simple construction, and light weight are some of the features of this new type-writer.

The price has been made so low as to place it within the reach of all.

Editor PHONOGRAM, N. Y. City.

DEAR SIR:

Do you know of any short-hand writers that would be willing to learn to write on the Franklin, with the understanding that we will give them positions as fast as we may have calls for operators for our type-writers?

We will furnish them with machines and room to work, if they are willing to give the time.

Yours truly,
F. W. BAILEY.

The above is a sample of many inquiries we receive, and we take this opportunity to say that our advertising columns are open to the public, giving them an opportunity to reach the best talent in this line.

PHONO-CHAT.

A Laughable Incident at the Exposition, Pittsburgh, Pa.

A crowd gathered round the weighing scales, all anxious to weigh themselves. A colored couple, in order to save time, got on the scales at once. The man watched and waited for the ticket to come forth, but his waiting was in vain. Both then stamped and jumped up and down, thinking possibly something might be wrong with the machine. All they could do would not produce the coveted ticket, and a perplexed look was observed stealing over their countenances. Finally, a man in the crowd asked the colored man if he had placed the necessary money in the slot.

"Yes, sah, I done do dat same," he replied. "I done put a ten-cent piece in dar for me and Amanda, but de darned t'ing don't show up wuf a cent. It's a dog-gone shame, boss, to beat a cullud man out of his stuff, and I'm goin' to tell dat Mister Johnsing wat I tink of it, too."

With this, they stepped off the machine, made a bee-line for the office, entered their complaint, and were surprised to find that a ten-cent piece would not answer the same purpose as two nickels.

Mr. J. W. Moakler, the phonograph agent for the Colorado and Utah Phonograph Co., has put one of his machines in the Antlers' hall-way, Colorado Springs.

The Columbia Phonograph Company, controlling Maryland, Delaware, and the District of Columbia, paid dividend No. 6 on September 19th. The business of this company is growing with great rapidity, and dividends are getting closer and closer together.

Ten Edison phonographs were received recently at 91 Canada Life Chambers, by Messrs. Horton & Emerson, the Toronto agents for that machine. These are the first phonographs ever brought to Toronto for commercial purposes, but the agents are confident that before long the phonograph will be as common an office adjunct as is the type-writer to-day.

One of the best users and most successful operators on the phonograph in the West is Miss Della Sandfos, operator of the phonograph for Gus V. Brecht Butchers' Supply Company, 1100 and 1112 Cass Avenue, St. Louis, Mo. During the last ten months she has transcribed from the phonograph thirteen thousand one hundred and thirty-three letters; the largest number in any one day was one hundred and twelve. She is a thorough believer in the phonograph, and a very successful operator.

The Indiana State Agency, acting under the authority of the North American Phonograph Company, have begun business under very auspicious circumstances. They will shortly begin manufacturing musical cylinders. The nickel-in-the-slot machine has not been put out yet to any extent in their state. Messrs. Leeds & Co. have charge of the exhibition business in Indiana. They sell the phonograph outfit and privilege for five hundred dollars, and let the exhibitors make all they can. Some of the exhibitors have made the price of the machine in two or three weeks.

The Texas Phonograph Company report the highest receipts from one automatic machine in a single day—thirteen dollars and twenty-five cents—in Austin. The greatest receipts from one single automatic machine in a month was one hundred and five dollars, in Austin. The Texas Phonograph Company are not manufacturing musical cylinders, as Galveston is rather devoid of first-class musicians.

THE PHONOGRAM,
Room 87, World Building.

Sept. 20th, 1891.

The receipts of the automatic business in New England are quite equal to last year, and the novelty has not worn off. The best way of exhibiting the phonograph is to use the ordinary motor phonograph with a fourteen-way tube, charging so much to each person who hears.

TESTIMONIALS.

HARRISBURG UNION SCHOOLS, }
W. V. Wright, Superintendent. }

HARRISBURG, Ohio., Sept. 20, 1891.
NATIONAL PHONOGRAPH PUB. CO.,
World Building, N. Y.

Please send me a sample copy of THE PHONOGRAM. I have been exhibiting a phonograph for the past six months, and have been very successful, considering the number of days I worked.

The phonograph never grows old to me, and a publication devoted to that wonderful little "talking machine" must be of inestimable value and unfold interest to the many friends of the phonograph.

DEAR SIR:

The August number has just arrived. We are heart and soul, as well as pocket-book, in this business, and wish to encourage and co-operate with any instrumentality which has for its aim and purpose the advancement of the interests with which we are identified, and we feel confident THE PHONOGRAM will serve this purpose.

Respectfully,
TEXAS PHONOGRAPH COMPANY

The North American Phonograph Co.,

OWNERS OF THE PATENTS OF THOMAS A. EDISON

— FOR —
Recording, Perpetuating, and Reproducing Articulate
Speech and other Sounds, and Exclusive Agent
for the Sole Licensee of the

AMERICAN GRAPHOPHONE COMPANY.

PRINCIPAL OFFICES: 10 WALL ST., NEW YORK.

LOCAL COMPANIES:

NAME OF COMPANY.	ADDRESS.	TERRITORY.
Alabama Phonograph Co.	Anniston, Ala.	Alabama.
Columbia	Washington, D. C.	Delaware, Maryl'd and Dist. of Col.
Colorado-Utah	Denver, Col.	Colorado.
Chicago Cen'l	Chicago, Ill.	Cook County, Ill.
Eastern Penn'a	Philadelphia, Penn.	Eastern part of State of Penn'vania.
Florida	Jacksonville, Fla.	Florida.
Georgia	Atlanta, Ga.	Georgia.
Iowa	Sioux City, Iowa	Iowa.
Indiana State Agency	Indianapolis, Ind.	E. R. Magie, Ag't, 27 So. Illinois St.
Kansas Phonograph Co.	Topeka, Kan.	Kansas and New Mexico.
Kentucky	Louisville, Ky.	Kentucky.
Louisiana	New Orleans, La.	Louisiana.
Michigan	Detroit, Mich.	Michigan.
Missouri	St. Louis, Mo.	Missouri, Arkansas, and Indian Ter.
Mississippi Agency	Conyngton, Sellers 27 Equitable Building, New & Conyngton	Orleans, La.
Minnesota Phonograph Co.	Minneapolis, Minn.	Minnesota.
Montana	Helena, Mont.	Montana.
New England	Boston, Mass.	New England States.
New York	New York, N. Y.	New York State.
Nebraska	Omaha, Neb.	Eastern part of State of Nebraska.
New Jersey	Newark, N. J.	New Jersey.
Ohio	Cincinnati, Ohio.	Ohio.
Old Dominion	Roanoke, Va.	Virginia, North and South Carolina
Pacific	San Francisco, Cal.	Arizona, California and Nevada.
Spokane	Spokane Falls, Wash.	Oregon, East 44° long. Washing'n, " 44° " and Idaho.
South Dakota	Sioux Falls, S. Dak.	South Dakota.
State Phono. Co. of Illinois	Chicago, Ill.	State of Ills., exclusive of Cook Co.
Texas Phonograph Co.	Galveston, Tex.	Texas.
West Penn.	Pittsburg, Penn.	Western part States of Penn. and W. Virginia.
Wisconsin	Milwaukee, Wis.	Wisconsin.
West Coast	Portland, Ore.	Oregon, West of 44° long. Washing'n, " 44° "
Wyoming	Cheyenne, Wy. Ter.	Wyoming.

HOLLAND BROS., OTTAWA, CANADA,

Agents for the North American Phonograph Co.

OCTOBER SPECIAL RATES.

"TIME IS MONEY."

HENCE THESE

SPECIAL RATES.

1 PAGE.....	\$25	1-4 PAGE.....	\$8
1-2 ".....	15	1-8 ".....	5

People that have anything connected with the Phonograph will see at once how they can forward their interests by taking advantage of the above.

FOR SALE!

Valuable Electrical Invention FOR THE UNITED STATES.

The Elastic Accumulator.

Invented and Patented by EMILE REYNIER, of Paris.

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Jerome B. Howard, Editor.

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PATENTS

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